

## THE MULTIPLE ORIGIN OF HORSES AND PONIES.<sup>1</sup>

HITHERTO it has been generally assumed that wild horses have been long extinct, that all domestic horses are the descendants of a single wild species, and that, except in size, ponies in no essential points differ from horses.

Now that systematic attempts are being made to improve native breeds of horses in various parts of the world, it is obviously desirable to settle once for all whether, as is alleged, occidental as well as oriental and African races and breeds have sprung from the same wild progenitors, and more especially if all ponies are merely dwarf specimens of one or more of the recognised domestic breeds of horses.

To be in a position to arrive at a conclusion as to the origin of the various kinds of domestic horses, and at the same time find an answer to the important and oft-repeated question, What is a pony? one must clear up as far as possible the later chapters in the history of that section of the Equidæ to which the true horses belong.

It is generally admitted that the ancestors of the living Equidæ reached the Old World from the New, the later immigrants crossing by land bridges in the vicinity of Behring Straits. If horses came originally from the New World, to the New World we may first turn for information as to their remote progenitors.

According to recent inquiries, North America possessed in pre-Glacial times at least nine perfectly distinct wild species of Equidæ. Some of these were of a considerable size—e.g. *Equus complicatus* of the southern and middle western States, and *E. occidentalis* of California were as large as a small cart-horse. Others were intermediate in size—e.g. *E. fraternis* of the south-eastern States; and at least one—*E. iau* of Mexico—was extremely small. Some of the American pre-Glacial Equidæ were characterised by very large heads and short strong limbs, some by small heads and slender limbs; and though the majority conformed to the true horse type, two or three were constructed on the lines of asses and zebras.

When true horses first made their appearance in America the climate and the land connections between the Old World and the New were very different from what they are to-day. One result of these differences was that before the close of the Pliocene period—i.e. prior to the great Ice age—it was possible for American horses to find their way into Asia and thence into Europe and Africa. One of the earlier immigrants (*Equus stenonis*) has left its remains in the Pliocene deposits of Britain, France, Switzerland, Italy, and the north of Africa. While *E. stenonis* was extending its range into Europe and Africa, two others (*E. sivalensis* and *E. namadicus*) were finding their way into India, and yet other species were doubtless settling in eastern Europe and Central Asia.

It may hence be safely assumed that as Africa now contains several species of zebras, Europe at the beginning of the Pleistocene period was inhabited by several species of horses.

We know that before the beginning of the historic age horses had become extinct in North America, but we have not yet ascertained what was the fate of the equine species which reached, or were evolved in, the Old World before or during the great Ice age. It is believed by some palæontologists that the Indian species, *E. sivalensis* and *E. namadicus*, became extinct, and that *E. stenonis* gave rise through one variety (*E. robustus*) to the modern domestic breeds, and by another (*E. ligeris*) to the Burchell group of zebras. *E. sivalensis*, unlike *E. stenonis*, but like the still earlier three-toed horse Hipparion and certain prehistoric South American species, was characterised by a depression in front of the orbit for a facial gland (probably similar to the scent-gland of the stag), and usually by large first premolar (wolf) teeth in the upper jaw. In some recent horses having eastern blood in their veins there seems to be a vestige of the pre-orbital depression, and in some of the horses of south-eastern Asia (e.g. Java and Sulu ponies), as in some zebras (e.g. Grévy's zebra and a

zebra of the Burchell type found near Lake Baringo), there are large functional first premolars. It is hence possible that lineal but somewhat modified descendants of *E. sivalensis* of the Indian Pliocene may still survive, and that *E. sivalensis* was a lineal descendant of Hipparion.

We are, however, more concerned with the ancestors of the domestic horses of Europe and North Africa than with oriental horses.

From osseous remains already found we know horses were widely distributed over Europe during the Pleistocene period, and that they were especially abundant in the south of France in post-Glacial times. It has not yet, however, been determined how many species of horses inhabited Europe during and immediately after the Ice age, nor yet to which of the pre-Glacial species prehistoric horses were genetically related. Bones and teeth from deposits and caves in the south of England seem to indicate that during the Pleistocene period several species of horses ranged over the west of Europe. The Pleistocene beds of Essex have yielded bones and teeth of a large-headed, heavily built horse, which probably sometimes measured more than 14 hands (56 inches) at the withers. From the "elephant bed" at Brighton portions of a slender-limbed horse have been recovered, and Kent's cave, near Torquay, has yielded numerous fragments of two varieties or species which differed somewhat from the Essex and Brighton species. The "elephant-bed" horse has hitherto been described as very small, but if one is to judge by the bones in the British Museum it may very well have reached a height of 50 or even 52 inches (12.2 or 13 hands). The Kent's cave horses were probably from 13 to 14 hands high. One in its build approached the Essex horse, the other the slender-limbed species of the "elephant bed" at Brighton. If there were two or more species in Pleistocene times in the south of England (then part of the Continent), it is probable that yet other species inhabited south and middle Europe and the north of Africa.

As already mentioned, horses were extremely abundant in the south of France in the not very remote post-Glacial period.<sup>1</sup> Evidence of the existence of large herds we have at Solutré, where for a number of years there was an open-air Palæolithic encampment. Near the Solutré encampment (which lies in the vicinity of the Saône, about midway between Chalons and Lyons), the bones of horses<sup>2</sup> and other beasts of the chase were sufficiently abundant to form a sort of rampart around part of the settlement. It is difficult to say how many species of horses are represented at Solutré, but there seems no doubt that the majority belonged to a stout, long-headed, but short-limbed animal, measuring about 54 inches (13.2 hands) at the withers. Though of smaller size, the typical Solutré horse had nearly as large joints and hoofs as the Essex Pleistocene species. Like the Essex horse, it seems to have been specially adapted for living in low-lying marshy ground in the vicinity of forests, and for feeding during part of the year on coarse grasses, shrubs, roots, and other hard substances, for the crushing of which large teeth set in long powerful jaws were indispensable.

That lightly built as well as stout species existed in post-Glacial as in Pleistocene times is made evident by bones found in caves and by drawings and sculptures made by Palæolithic hunters. Of the existence of two kinds of horses in post-Glacial times, practically identical with the stout and slender-limbed Pleistocene species, the cave of Reilhac, near Lyons, is especially eloquent. It is, however, mainly by the engravings on the walls of caves in the Dordogne, Gard, and other districts in the south of France that the existence in late Palæolithic times of various kinds of light and heavy species of horses is made manifest.

In the cave of La Mouthe, e.g., two horses are incised on the same panel—perhaps by the same hand—one of which (Fig. 1) has a very long head attached nearly at right angles to a short thick neck, while the other has a small head, Arab-like ears, and a long slender neck such as we are wont to associate with racehorses.

In the Combarelles cave (Commune of Tayac), the walls

<sup>1</sup> By Dr. J. Cossar Ewart, F.R.S. Abridged from *Trans. Highland and Agricultural Society of Scotland*, vol. xvi., 1904.

<sup>2</sup> An account of the prehistoric horses of Europe, by Dr. Robert Munro, will be found in the *Archæological Journal*, vol. lix. No. 234.

<sup>3</sup> Toussaint, of the Lyons Veterinary College, believes that at Solutré there were fragments of at least 100,000 horses, all of which had been used as food.

of which for more than a hundred yards are crowded with animal figures, there are, in addition to twenty-three nearly full-sized engravings of horses, numerous studies of equine heads. Some of the Combarelles horses decidedly differ from those of La Mouthe. There is, e.g., a large drawing of a heavily built horse (Fig. 2) with a coarse head, an arched muzzle, a thick under lip, rounded quarters, and a tail with long hair up to the root. At another part of the



FIG. 1.—Horse with a long head, from an engraving in the cave of La Mouthe. (Munro's "Prehistoric Horses.")

cave there is what appears to be a natural size engraving (Fig. 3) of a head which in outline is wonderfully suggestive of an Arab, and at yet another part of the cave a horse with a pony-like head is represented, behind which stands an animal with a head like that of a modern Shire horse.

In addition to the types figured on the walls of caves, there are others carved on pieces of horn and other durable substances. The majority of the horses engraved on horn are characterised by a very large coarse head, but a few (e.g. the horse from the Kesserloch cave

near Schaffhausen) are remarkable for the small size of the head, the fine muzzle, and small ears

As already indicated, the men of the early Stone age have left us drawings of some four or five different kinds of horses, some with large heads and stout limbs, some with fine heads and slender limbs, some with a nearly straight croup and a well-set-on tail, others with rounded quarters and the root of the tail far below the level of the croup. Drawings made at the present day will be of little use some centuries hence in providing an answer to the question, How many species of horses existed in Europe at the beginning of the twentieth century? They will confuse rather than enlighten future inquirers, because for several generations breeders of horses, like breeders of cattle and dogs, have with the help of selection and isolation succeeded in creating numerous artificial strains. Is there any reason for supposing the evidence afforded by the prehistoric drawings is more valuable to us than recent drawings will be to our successors thousands of years hence, should they desire to ascertain how many species of horses Britons possessed at the end of the nineteenth

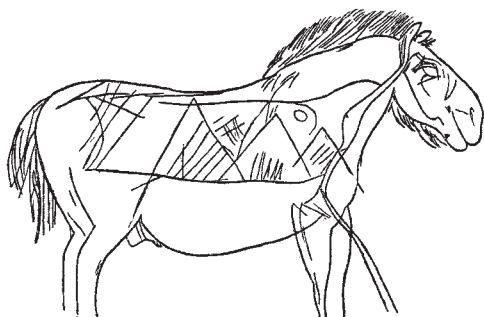


FIG. 2.—Engraving of a heavily built horse, from the Combarelles cave (18). (Munro's "Prehistoric Horses.")

century? That depends on whether in Palæolithic times the horse was domesticated in Europe.

It is extremely probable that the men of the early Stone age had now and again tame horses, just as nowadays we have at times tame zebras, but it is most unlikely that they had herds of horses which they systematically bred and reared as stockmen now breed and rear cattle.

That the domestication of the horse as now understood was not attempted in Palæolithic times may be inferred

from the fact that the majority of the horses in the Solutré bone-mounds were from five to seven years old. Had horses been bred for food as we nowadays breed cattle, young individuals would have been most abundant at Solutré.

If it is admitted that the engravings on the walls of caves and on pieces of horn fairly accurately represent animals which actually existed at the end of the Ice age, and if it is also admitted that the creation of new varieties by artificial selection was never attempted until at the earliest the arrival of the Neoliths, it follows that in post-Glacial as in Pleistocene times there were several perfectly distinct wild species of horses in Europe.

For some reason or other it has hitherto been very commonly assumed that, as in recent times the wild striped horses of South Africa—the quagga and zebras—have been gradually supplanted by occidental or oriental domesticated horses, the wild horses of Europe were gradually displaced by domesticated varieties introduced by the Neoliths. It seems to me quite unnecessary to assume that the indigenous varieties so long familiar to the Palæolithic inhabitants were exterminated.

The advent of the Neoliths, instead of implying the extermination of indigenous varieties, in all probability meant the introduction of yet other varieties.

I may here repeat that now, as throughout the nineteenth century, it is generally assumed that all the domestic breeds—small as well as large—have sprung from a single wild species. The great French naturalist Cuvier not only believed that all living horses belonged to one species (the *Equus caballus* of Linnæus), but also that there was no specific difference between living breeds and the fossil horses of the Pleistocene period. Prof. Sanson, of the French National College of Agriculture, in his "Traité de Zootechnie" (1901), assuming a single origin for domestic breeds, divides recent horses into two groups—a long-headed and a short-headed group—each of which consists of several races, while Captain Hayes, in his recently published "Points of the Horse" (1904), says, "no breed of horses possesses any distinctive characteristic which serves to distinguish it from other breeds," and adds that "as a rule locality . . . and artificial selection are the chief factors in the formation of breeds." Elsewhere Captain Hayes states, "As far as I can learn, no attempt has been made to separate ponies from horses except on the purely artificial basis of height."<sup>1</sup> Even those who are prepared to admit that recent horses may have sprung from several wild species allege that owing to domestication, intercrossing, and artificial selection it is no longer possible to indicate the distinguishing characters of the two or more wild species which took part in forming the present races and breeds.

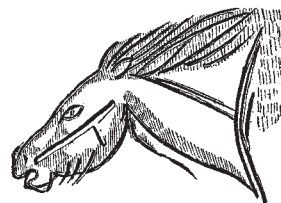


FIG. 3.—Head of a horse with a profile like that of an Arab, from the Combarelles cave (4). (Munro's "Prehistoric Horses.")

#### THE WILD HORSE (*Equus caballus przewalskii*).

The wild horse may be first considered. For many years the semi-wild Tarpan of the Russian steppes was regarded as the nearest living relative of the wild ancestor of the domestic breeds, but in 1881 the existence of a true wild horse was announced by the Russian naturalist Polyakov. This horse occurs in the vicinity of the Gobi desert and the Great Altai Mountains, one variety living to the south-east, another to the west, and a third to the south of Kchdo. All three varieties are of a yellow-dun colour, the south-eastern (Zagan-Nor) form being especially characterised by a dark muzzle, dark points, and a dark mane and tail; in the western (Urungu) variety the muzzle is nearly white, the limbs are light down to the fetlocks, and the mane and tail are of a reddish-brown tint, the southern (Altai) form being nearly intermediate in its coloration. The markings consist of a narrow dorsal band, faint indications of shoulder stripes, and indistinct bars in the region

<sup>1</sup> "Points of the Horse," pp. 422-425.



of the knees and hocks. In all three varieties the mane is short and upright in the autumn, but long enough in spring to arch to one side of the neck; in summer the upper two-thirds of the dock of the tail carries short hair, the distal third long hair, which continues to grow until it reaches the ground; in winter the upper two-thirds of the tail carries hair from 2 to 4 inches in length. The hair of the body and limbs is short in summer, but under the jaw and over the greater part of the body and limbs it is from 3 to 4 inches in length in winter.

The hoofs are narrower and have longer "heels" than in the common horse, but, as in the common horse, each limb is provided with a chestnut and with an ergot, the hind chestnut (hock callosity) being very long and narrow.

In the variety (Fig. 4) occurring in the Altai south of Kobdo—probably the most primitive of the three—the head is large and coarse, and, compared with the length of the body, longer than in any domestic breed. In a side view it is noticed that the forehead is prominent (bumpy), the lower part of the face straight or slightly convex, the under lip long, and that the head forms nearly a right angle with the short neck. The eyes are lateral in position, and appear unusually close to the ears owing to the great length of the space between the eye and the nostril. The ears are long and generally project obliquely outwards (Fig. 4), as in many cart-horses. The croup is nearly level, but the hocks are usually bent and turned in. Judging by the behaviour, during the last two years, of the wild horse in my possession, I am inclined to think his less remote ancestors, though in all probability members of the steppe fauna, lived for a time (perhaps during the Ice age) in the vicinity of forests. As is the case with other gregarious animals, he strongly objects to be separated from his companions, and he also objects to have his movements circumscribed by fences. It has often been said "nothing jumps better than a cart colt." The cart colt jumps because he has sprung from big-jointed, broad-hoofed, forest-haunting ancestors whose existence often depended on their being able at a bound to clear fallen trees and other obstacles. The wild horse when shut up in a loose-box by himself is very restless, and keeps rearing up against the door until set at liberty; if placed in a paddock away from his special comrades he generally succeeds in either scrambling over or breaking down the fence.

The wild horse never encounters fences in the Gobi desert, but, probably because he had forest-bred ancestors which had often to cross fallen trees, he endeavours without a moment's hesitation to clear all obstacles that come in his way, while true desert forms endeavour to break through them.

It has been suggested that the wild horse of the Gobi desert is not a true wild animal, but only a domesticated breed that has reverted to the wild state.<sup>1</sup> Against this view I may mention (1) that all the wild horses are of a yellow-dun colour, and that though those to the west of Kobdo differ in tint from those to the east, the eastern and western varieties seem to be connected by the less specialised variety to the south of Kobdo; (2) that travellers in Central Asia all agree in stating that the Mongolian ponies vary greatly in colour—in a Chinese hymn known as the "Emperor's Horses" as many as thirteen colours are referred to; (3) the descendants of the horses which escaped from the Spaniards in America after several centuries of freedom were of all sorts of colours; and (4) in horses which live in sub-Arctic areas the hair at the root of the tail tends to increase so as to form a sort of tail-lock, which when caked with snow protects the hind-quarters during snow storms; the complete absence of this tail-lock—fairly well developed in one of my Mongolian ponies—is a very strong argument against the assumption that Prjevalsky's horse is nothing more than a domesticated breed that has reverted to the wild state.

The wild horse of the Gobi desert is certainly the least specialised of all the horses living at the present day. In being of a yellow-dun colour, in shedding annually the hair of the mane and the hair from the upper two-thirds of the tail, in having ergots and chestnuts on the hind- as well as

on the fore-limbs, and in having canines and fairly large upper first premolars, Prjevalsky's horse is distinctly primeval. Only in the all but complete absence of stripes and in having very long powerful jaws armed with relatively large teeth can the Gobi horse be said to be specialised.

It is extremely probable that Prjevalsky's horse was familiar to the troglodytes who inhabited the Rhone valley in prehistoric times. One might even go further and say that in Fig. 1, from an engraving in the cave of La Mouthe, we have a fairly accurate representation of the head of Prjevalsky's horse.

It is, of course, impossible to say which of the recent breeds are most intimately related to the Gobi horse. Though the head and ears are suggestive of some of the heavier occidental breeds, in its trunk and limbs it more closely resembles Mongolian and Korean horses, some of which, like Prjevalsky's horse, decidedly differ from Shires and Clydesdales in having a small girth owing to a want of depth of body. To which domestic breeds the wild horse has contributed characters will probably become more manifest after he has lived for some time under domestication. That heavy occidental breeds are not pure descendants of Prjevalsky's horse is suggested by the fact



Photograph by M. H. Hayes.

FIG. 4.—Prof. Ewart's yearling wild horse in summer coat. (From Hayes' "Points of the Horse.")

that cart-horses, like zebras, have usually six lumbar vertebrae—the wild horse of Asia has only five, like the wild asses.

#### THE CELTIC PONY (*Equus caballus celticus*).

From the most primitive member of the Equidae family I shall turn to the most specialised, viz. to what I have ventured to call the Celtic pony.

In colour and markings a typical Celtic pony only differs from the intermediate (Altai) variety of the wild horse in having a slightly darker muzzle, a less distinct light ring round the eye, and a more distinct dorsal band. The hair is similar in structure, but slightly longer in the Celtic pony during winter (Fig. 5), more especially under the jaw—where it forms the so-called beard—over the hind-quarters, and on the legs. In the mane, tail, and callosities the Celtic pony is very different from the wild Gobi horse. The mane is made up of a mesial portion (nearly twice the width of the entire mane in an Arab) consisting of strong dark hair, and of two lateral portions the hair of which is lighter and finer and less circular in section than the hair of the central portion. The mane in the adult grows at the rate of from 9 to 10 inches per annum, and as only about one-third of the hair is shed annually, the mane

<sup>1</sup> It was formerly stated that the wild horse was simply a hybrid between a Mongolian pony and a kiang. I recently showed that a hybrid of this kind is quite different from the wild horse. See *Proc. Roy. Soc. Edin.*, vol. xxiv. part v., 1902-1903, and *NATURE*, vol. lxxviii. p. 271.

reaches a considerable length. Owing to the great width of the middle portion the one half of the mane generally falls to the right side, the other to the left. The front

her head low and to one side, made a rush for the shelter of an adjacent wood; the half-bred colt—prevented by her Celtic blood from running away—tried in vain one position after another, and long before the storm ceased looked thoroughly miserable and began to shiver as if chilled to the bone. It hence follows that the tail-lock is not, as I at first assumed, an inheritance from a primitive ancestor akin to the wild horse, but a highly specialised structure which eminently adapts the Celtic pony for a sub-Arctic environment. I need hardly say the caudal fringe is not a product of artificial selection, for even in Iceland, where it reaches its maximum development, neither its existence nor its use has, so far as I can gather, ever been referred to. It need only be added that to maintain a tail-lock of this kind it is necessary that the short wiry hairs of which it consists require to be renewed once a year.

In separating asses and zebras from horses, stress has hitherto been laid on the difference in the mane and tail, and especially on the absence of hind chestnuts. As already pointed out, the wild horse during summer in its mane and tail agrees with asses and zebras. The mane and tail are hence no longer of specific importance. This is also true of the chestnuts, for in the Celtic pony, as in asses and zebras, the hind chestnuts (hock callosities) are completely absent. In the wild horse, as in the vast majority of heavy and cross-bred horses, the hind chestnuts reach a considerable size, but in asses and zebras and the Celtic pony I



Photograph by G. A. Ewart.

FIG. 5.—A typical Celtic pony in winter coat. (Note the "beard," forelock, and tail-lock.)

part of the mane hangs down over the face to form a forelock (Fig. 5).

The most remarkable feature of the Celtic pony is the tail. To begin with, the dock is relatively very short—so short that one is apt to suppose it has been docked. The distal two-thirds of the dock carries long dark hairs, the majority of which continue to grow until they trail on the ground. During winter and spring the proximal third of the dock—about 4 inches—carries stiff hair from 3 to 6 inches in length, which forms what may be known as a caudal fringe or tail-lock (Figs. 5 and 6). In the case of Arabs and other semi-tropical horses the first 1 or 2 inches of the dock are usually covered with short fine hair like that over the hind-quarters, but in the Celtic pony fine wiry hairs from 4 to 5 inches in length extend right up to the root of the dock under cover of the body hair of the croup. The most distal hairs of the tail-lock overlap, but are quite distinct from, the long persistent hairs carried by the lower two-thirds of the dock. The hair in the centre of the fringe, of the same colour as the dorsal band (Fig. 6), projects obliquely backwards; the hair at the sides is light in colour and projects obliquely outwards. The presence of this very remarkable bunch of hair at the root of the tail was quite incomprehensible until I noticed what happened during a snowstorm. The moment the storm set in the pony orientated herself so that the snow was driven against her hind-quarters. In a few minutes the lock of hair was spread out to form a disc, to which the snow adhered, and thus provided a shield which effectively prevented the flakes finding their way around the root of the tail, where they would have soon melted and effectively chilled the thinly clad inner surface of the thighs. Provided with a caudal shield, long thick hair over the hind-quarters and back, and a thick mane covering both sides of the neck and protecting the small ears, a Celtic pony is practically snow-proof. While the storm lasted the pony in question stood perfectly still, with her head somewhat lowered, save when she shifted her position as the wind veered from north-west to north. Very different was the behaviour of an Arab, and a thoroughbred Highland colt close by. After trying various attitudes, the Arab, carrying



Photograph by G. A. Ewart.

FIG. 6.—Celtic pony, to show tail-lock in midwinter.

have failed to find any rudiments of hind chestnuts either before or after birth. Further, in the Celtic pony the front chestnuts are small, and, still more remarkable, the fetlock



callosities (ergots) have entirely vanished; in asses and zebras the ergots are always present, and in some cases still play the part of pads. The Celtic pony is hence not only more specialised—further removed from the primitive type—in its mane and tail, but also in having lost the fetlock pads (ergots) and the hock (heel) callosities. Nature makes little effort to get rid of useless vestiges, so long as they are harmless. When an ergot or a chestnut is accidentally torn off there is considerable loss of blood. It is conceivable that in the remote past horses which happened to be born without ergots proved better adapted for a life in the sub-Arctic regions—were less likely to suffer from injury when moving through frozen snow and to become a prey to wolves—and hence had a better chance of surviving and leaving descendants.<sup>1</sup>

There is also evidence of specialisation in the teeth of the Celtic pony. In many horses—e.g. the horses of south-eastern Asia—the canines and upper first premolars (wolf teeth) are well developed, but in the Celtic pony the first premolars seem to be invariably absent, while the canines are either absent or very minute even in old males. In all the typical Celtic ponies I have seen the head is small, Arab-like in outline, and well put on to a relatively long neck; the muzzle is fine and slightly arched, the under lip short and well moulded, the nostrils are wide, and the eyes on a level with the forehead, while the ears are short, white-tipped, and carried as a rule in an upright position. Owing to the shortness of the jaws the proportion of the head to the body is as 1 to 2.50 instead of 1 to 2.20, as in the wild horse.

Except in size I have been unable to discover any difference between the skeleton and teeth of the Celtic pony and those of the small horse of the "elephant bed" of the Brighton Pleistocene. In the most northern part of Iceland, where the few pure specimens of the Celtic pony survive, only a height of 12 hands (48 inches) is reached—under more favourable conditions the height would probably be 50 or 52 inches, the size of some of the "elephant-bed" horses and of the smaller variety of the desert-bred Arab, to which the small slender-limbed occidental pony closely approximates.

In temperament the Celtic pony is very different from the wild horse. Captain Hayes had no difficulty in handling the wild horse in my possession, but from first to last, though giving evidence of marked intelligence, it was absolutely irresponsive and spiritless. A Celtic pony, on the other hand, rapidly learns what the trainer wishes and responds with alacrity. In its keenness and speed, staying power and agility, a pure Celtic pony is as different from an ordinary heavy-headed Iceland pony (*i.e.* a dwarf horse) as an Arab is from a cart-horse.

The question may now be asked, Is my most typical Celtic pony a pure or nearly pure specimen of a once widely distributed wild species, or is it at most an approximation to an ideal type, living representatives of which no longer exist? I regard the pony described above as an almost pure representative of a once widely distributed wild species, for the following reasons:—(1) In its colour and markings it is almost identical with Prjevalsky's horse, and not unlike some of the varieties of the wild Asiatic ass. (2) The hind chestnuts and all four ergots are completely absent. (3) The tail-lock is perfectly adapted for its work—were the hairs shorter the fringe would be ineffective, were they longer the snow-shield, if ever formed, would rapidly disintegrate. (4) The first premolars are completely absent, and only one of the four canines is represented, and that only by a minute peg which barely projects beyond the gum. (5) The pony in question proved sterile, with stallions belonging to five different breeds, as well as with a Burchell zebra and a kiang; but she at once bred when mated with a yellow-dun Connemara-Welsh pony, which closely approximates to the Celtic type. (6) Ponies having the more striking Celtic characteristics occur in isolated and outlying areas, where one would expect to find remnants of an ancient highly specialised species which perchance reached the Old World from the New in pre-Glacial times or during warm inter-Glacial periods—in, e.g., Iceland (which has been almost completely isolated since the twelfth or

thirteenth century), the Færøe Islands, Shetland, the Hebrides, the west of Ireland, and Finland.

*Flat-nosed Variety of the Celtic Pony.*—In the Færøes, the Hebrides, and in Shetland there are slender-limbed ponies which, except in their colour and the shape of the head, and in some cases the form of the hind-quarters, closely agree with my typical Celtic pony. In these ponies the depression below the eyes is more pronounced, and extends well-nigh to the muzzle, which is nearly flat. The nostrils look downwards, and the space between them, instead of being arched as in the Iceland specimen, is flat, and forms nearly a right angle with the face.

Some of these flat-nosed ponies are of a foxy-red colour, others are dark brown. According to Landt, the majority of the Færøe ponies a century ago were foxy-red—the St. Kilda ponies, eighteen in all, seen by Martin at the end of the seventeenth century, were also of a red colour—the others were with few exceptions dark. A foxy-red Færøe pony in my possession has neither a dorsal band nor bars on the leg, but it has a light mane and tail, a nearly straight croup, and well formed hind-quarters. All the other foxy-red Færøe ponies I have seen or heard of closely resemble the one in my collection.

The dark Færøe ponies, like the dark Barra ponies, only differ from the foxy-red ponies in not having in every case a straight croup and a high set-on tail, while the dark variety of the Celtic pony found in Shetland is in build more like the typical Iceland specimens than the Færøe variety.

Herodotus (*v.q.*) says of the horses of the Sigynnæ—the only tribe he knew the name of across the Danube—they "are shaggy all over the body, to five fingers in depth of hair: they are small, flat-nosed, and unable to carry men; but when yoked to chariots they are very fleet, therefore the natives drive chariots." This description, so far as it goes, is singularly accurate of the foxy-red Færøe ponies, even to their being very fleet "when yoked to chariots." It is extremely probable that in the red coloured Færøe ponies we have a remnant of a very old and once widely distributed variety, the origin of which is never likely to be revealed. For some unaccountable reason the silver mane and tail are as a rule either handed on untarnished to cross-bred offspring or they reappear in the second or one of the subsequent generations. It is hence possible that various large breeds—such as the Suffolk Punch, the white-maned horses of the Hebrides and of the north and west of Ireland, certain silver-maned Hungarian and Russian races, not to mention Chittabob and other English thoroughbreds—have all inherited their light manes and tails from an ancient foxy-red variety of the Celtic pony.

The origin of the dark brown variety of the Celtic pony is also wrapped in mystery. These dark brown ponies may represent another old variety from which the Exmoors have sprung—a variety which has contributed the tan-coloured muzzle and the ring round the eye so characteristic of many of the best Highland and Island garrons. One of these dark brown ponies, brought from Barra as a two-year-old, looked for a time like a miniature thoroughbred. Now as a three-year-old it might pass for one of the oldest and best type of the dark Færøe ponies. Neither the dark nor the red Færøe ponies ever possess all the Celtic characteristics; at the most they are three parts pure, and I may add they cross freely with Norwegian and other breeds, generally transmitting such Celtic "points" as they possess to their mixed offspring.<sup>1</sup> It is worthy of note that in some of the small-headed horses engraved in the Combarrelles and other caves inhabited in Palæolithic times, the croup is straight and the tail set on high as in many Arabs; in others the tail, instead of being in a line with the croup, looks as if it had been an afterthought—an appendage inserted fairly well up in some cases, lower down in others, as is the case in many large and small horses with rounded quarters. In the engravings showing a small-headed horse with a straight croup we seem to have the foxy-red variety represented; in those with somewhat drooping quarters we may have a representation of the dark brown variety of the Celtic pony.

If one may judge from its specialisation and from its being now adapted for sub-Arctic conditions, the Celtic pony belongs to a variety which at a very remote period branched

<sup>1</sup> See Marshall and Annandale, *Proc. Cam. Phil. Soc.* vol. xii. part iv.

<sup>1</sup> If, as seems likely, the absence of ergots (*i.e.* of spurs in the centre of the footlocks) is an advantage in arid regions, such as the Libyan plateau, we can understand their frequent absence in Barbs and Arabs.

off from the main stem and possibly reached Europe and North Africa long before the advent of the Neoliths—to become the progenitors not only of occidental but also of African races.<sup>1</sup>

As might have been anticipated, Celtic characters can often be identified in British and other occidental breeds. Many thoroughbreds, which are an unequal blend of Barbs and of Arabs in which Eastern races often prevail, and of light and heavy occidental varieties, show traces of Celtic ancestors. Many small thoroughbreds "ride like a pony," or have a pony head, or pony legs, some even want the ergots or hind chestnuts, or the tail has a vestige of a fringe, or there is the gait and temperament, alertness and intelligence of the pony. Many of the Highland garrons have pony characteristics, and this is also true of all the old mountain and moorland breeds, more especially of the mealy-nosed Exmoor ponies and some of the better bred dun-coloured Connemaras.

Even in Clydesdales of the older type pony characters sometimes surge to the surface, while in cross-bred animals they sometimes predominate. Recently I heard of a powerful active 17-hands horse—with a wonderful reputation for speed, strength, and staying power—in which the hind chestnuts, greatly to the surprise of the owner, were completely absent. On making inquiries as to the pedigree of this horse, I ascertained he was bred in Caithness, and was the grandson of a Highland pony.

#### THE NORSE HORSE (*Equus caballus typicus*).

During prehistoric times in certain parts of Europe a tundra fauna gave place to a steppe fauna, which later was succeeded by a forest fauna. Evidence of this succession we especially have in the rock-shelter at Schweizersbild, near Schaffhausen. In the lower deposits the remains of the reindeer, musk-ox, variable hare, Arctic fox, and other tundra forms occurred. Nearer the surface were relics of hamsters, the woolly rhinoceros, kiang, horse, and other denizens of the steppes; and on still higher layers the bones of the beaver, hare, and squirrel, the badger, pine martin, and wild boar, the stag, roe deer, urus, horse, and other recognised members of a true forest fauna.

In the case of the Equidae it is often extremely difficult to determine to which species any given bones belong, and hence it is impossible to state definitely that the horses found along with the hamsters and other steppe forms essentially differed from those which were contemporaries of the stag and wild boar and other typical forest forms.

It may, however, be assumed that even in post-Glacial times the majority of the inhabitants of the steppes would when mature be quite or nearly whole coloured, while frequenters of the forests would as often be either striped or spotted—that, e.g., the horse which frequented the Rhine valley along with the kiang and woolly rhinoceros would resemble the wild horse (*E. c. przewalskii*) which, with the kiang, now lives in the vicinity of the Great Altai Mountains, while the horse which at a subsequent period was a contemporary of the wild boar, stag, and roe deer would be more or less richly striped, and in its limbs and general conformation adapted for a life in or near forests.

That there is some ground for this assumption will, I think, be admitted when due consideration is given to results obtained by crossing various kinds of horses with a Burchell zebra. When ponies of the Celtic type—i.e. ponies which in their colour are identical with Prjevalsky's horse, almost certainly the lineal descendant of the steppe horse of Palæolithic times—are crossed with a male Burchell zebra, hybrids are obtained which, while in build strongly suggesting a Burchell zebra, are as profusely striped as the great zebra of Somaliland—have at least five times as many transverse stripes across the trunk as occur in their zebra sire. When,

however, pony mares of the Norwegian type are crossed with a Burchell zebra, the hybrids resemble in make their Norse dams, and in their markings closely approximate the common or mountain zebra. The explanation of these remarkable differences seems to be that in the case of the Celtic pony hybrids the remote (Grévy-like) ancestors of the Burchell zebra control the development and determine the plan of the decoration, while in the case of the Norse pony hybrids the remote striped-horse ancestors contribute the more obvious characters—the Norse ponies having more influence in determining the plan of striping than the highly specialised Celtic ponies, from which stripes had probably all but completely disappeared countless generations before they began to fade on the horses which belonged to the forest fauna.

It is probable that the highly specialised Celtic pony, as well as the primitive Gobi wild horse, belong to the steppe fauna, and it is equally probable that the yellow-dun (Fjord) horse, in which a striped coat may be said to be latent, belongs to the forest fauna. If this be admitted, it follows that the environment of the Norse race has been for untold ages so different from that of the Celtic pony and the wild horse that it centuries ago acquired the rank of a distinct species, or at least a well marked natural variety.

The question now arises, Does there exist in any of the outlying parts of the world (where artificial selection has been made use of to conserve old rather than to create new types) horses of a red rather than of a yellow-dun colour—more like the red deer than the kiang—horses with a sufficient number of imperfect stripes on the body and bars on the legs to indicate descent from ancestors decorated after the manner of the mountain zebra? As is now generally known, dun-coloured horses with remnants of a striped coat now and again make their appearance in all parts of both the Old and New World. It is also a matter of common knowledge that dark yellow-dun horses, sometimes with fragments of numerous stripes, are always to be met with in, amongst other places, Mongolia, Tibet, the North-West Provinces of India (especially in the State of Kattiawar), and in the north-west of Europe, more especially in Norway, the Highlands and islands of Scotland, and in Iceland. With the exception of the Kattiawars, which, probably as the result of rigid selection, stand apart, all the others have many points in common—some of the dun Mongol ponies agreeing closely with Norwegians—but they all—the Kattiawars more than the rest—decidedly differ from *E. c. przewalskii*, the wild horse of the Great Altai Mountains, and from typical specimens of the light yellow-dun Celtic pony.

The most richly striped horses I have hitherto come across occur in the north-west of Scotland. One of these recently examined is alike in make, colour, and markings so unique, and looks so little modified by domestication and artificial selection, that it must, I think, be considered as a fairly typical specimen of a once wild species. The history of the yellow-dun striped race, to which the specimen alluded to belongs, has not yet been written, but there is little doubt that it was introduced into Scotland from Scandinavia about the end of the eleventh or beginning of the twelfth century. As this yellow-dun striped race may very well have been familiar to Linnaeus, it may, I think, be taken as the type of the large occidental breeds, and known as the *Equus caballus typicus*. A typical specimen of the Norse variety is of a dark yellow-dun colour, with black "points" and a nearly black mane and tail. The mane is long and heavy, and tends to fall to both sides of the neck as in the Celtic pony. Only a few hairs at the root of the tail are shed in summer, and there is no attempt to form a tail-lock in winter, while the footlocks, never very long, are limited to the region of the ergots. The forehead is decorated with narrow stripes, which in their number and arrangement agree more with the mountain than with the true Burchell zebra. A broad dorsal band extends along the back to lose itself in the tail; there are stripes on the neck, and faint stripes extend a short distance from the dorsal band across the body, as in the British Museum quagga; while the legs, especially in the region of the "knees" and hocks, are marked by distinct bars.

The ears are short and are carried in a nearly upright position; the forehead (which is not particularly wide), in having two ridges extending upwards from the prominent

<sup>1</sup> That the Celtic pony is akin to the smaller high-caste Arabs has already been hinted. The only fundamental difference, apart from the coat, mane, and tail, between many small Arabs and a Celtic pony is in the ears: in the Arab they are long and often incurved at the points. The long ears of the Arab may either be due to Eastern blood of the Kattiawar kind or to long ears being an advantage to the wild ancestors that frequented the great Libyan plateau, as long ears are of advantage to the mountain zebra, and to the kangaroo of the Australian bush. About the origin of the large varieties of Arabs provided with ergots, with hind chestnuts like those of Prjevalsky's horse, a somewhat long head, a tendency to a Roman nose, large joints, and a circumference of  $7\frac{1}{2}$  to 8 inches below the knee, I am unable to offer an opinion.



eyes to meet under the forelock, differs greatly from the "bumpy" forehead of Prjevalsky's horse and the flat forehead of the Celtic pony. The space between the orbit and the nostril is relatively longer than in the Celtic pony, but shorter than in Prjevalsky's horse. The eyes project beyond the level of the forehead. In the Celtic pony the eyes are large and adapted for a wide range, in the wild horse they are some distance from the front of the head, in the Norse horse they are small and look downwards rather than forwards. The outline of the face becomes convex above the muzzle, and ends in a somewhat long upper lip, adapted, like the upper lip in the giraffe, for feeding on leaves and twigs. In the neck and shoulders, trunk and limbs, the Norse variety may be said to resemble a small cart-horse of the Suffolk type.

Compared with the wild horse, the withers are lower and the hind-quarters more rounded, and the tail springs more abruptly and at a lower level, and hence fails to convey the impression that it is a direct continuation of the trunk. The dock is relatively longer than in the Celtic pony, but shorter than in the wild horse. The limbs are short, but the joints are large and the hoofs fairly broad, hence in a side view of the foreleg a considerable increase is noticed as the thick fetlock joint is reached.

It will be evident from what has been said that the Norse horse differs chiefly from the wild Gobi horse in being of a

I need only add that I regard the Norse race as the foundation of what in the Highlands are known as garrons. Horses of this type may very well have been originally obtained by blending the old indigenous yellow-dun striped race with Flemish and French breeds imported direct from the Continent or introduced from England during the middle ages. Further, it is extremely probable that the Norse race took part in forming the small active Clydesdales of a former generation.

#### OTHER OCCIDENTAL HORSES.

In addition to oriental and African varieties, which doubtless include several wild species amongst their ancestors, there are two or more occidental varieties which in various ways differ from the Norse and Celtic races and from Prjevalsky's horse.

One of the latter races include long, low, heavily built animals with unusually long heads, another consists of short-bodied animals with a large head and a pronounced Roman nose.

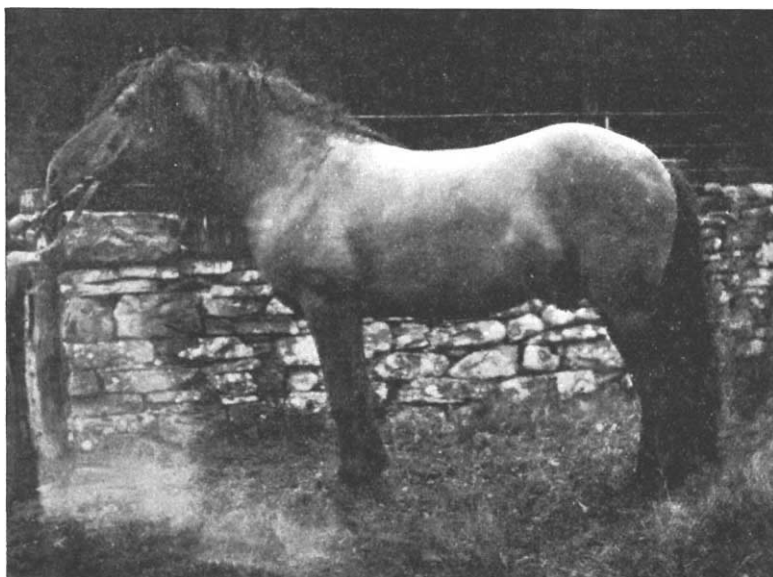
The long-headed variety which occurs in the Hebrides and the Central Highlands reminds one of the horses engraved during the Stone age on a piece of reindeer horn. In one specimen of this variety met with in Perthshire the profile is straight and the distance from the orbit to the nostril is 13 inches, *i.e.* 2 inches more than in a member

of the Norse breed of a like size, and 4 inches longer than in a 14 hands Connemara pony allied to the Celtic race. Some of these long-headed forms with a straight profile and a well moulded muzzle resemble the horses of the Parthenon.

Horses with a pronounced Roman nose also occur in the western islands and Highlands of Scotland, and in Ireland, Austria, America, and other parts of the world into which breeds were introduced from Spain. One of this Roman-nosed type, of a yellow-dun colour, met with in the Outer Hebrides was especially interesting. It very decidedly differed from members of the Norse race in the same district, but, on the other hand, it agreed in the outline of the head with some of the engravings in the Dordogne caves. It is hence conceivable that the Roman-nosed variety (from which the modern Shire breed may be an offshoot) is a very old one—a variety which was firmly established centuries before domesticated breeds first made their appearance in Europe.

#### SUMMARY.

I have endeavoured to indicate that in post-Glacial as in pre-Glacial times there were several distinct species of horses, and that it is extremely probable some of the prehistoric species and varieties have persisted almost unaltered to the present day. I have shortly described three distinct kinds of living horses, *viz.* the wild horse of the Gobi desert (*E. c. prjevalskii*); the Celtic pony, which though no longer wild, may be known as the *E. c. celticus*; and the Norse horse, which may very well stand as the type of one of the large occidental breeds, and be known as *E. c. typicus*. I have also pointed out that in addition to these three very distinct types—two at least of which have taken part in forming quite a number of our British breeds—we have a long-headed, heavily built variety with a straight profile, and a long-headed, heavily built variety with a more or less pronounced Roman nose. I have also indicated that in addition to several occidental varieties there are several African and oriental varieties, and I might have added that, in so far as the English thoroughbred is a mixture of African and oriental varieties and of occidental light and heavy varieties, it might be cited as an excellent example of a breed which includes amongst its ancestors several wild species—a breed which has had a multiple origin.



Photograph by G. A. Ewart.

FIG. 7.—A richly striped dark yellow-dun horse of the Norse type, which has a general resemblance to the Combarelles horse reproduced in Fig. 2.

darker dun colour, in being far more richly striped, in the shape of the head, size of the ears, position of the eyes, and also in the muzzle, mane, tail, hind-quarters, joints, and hoofs. From the Celtic pony the Norse horse also differs in the colour and markings; but it especially differs in the tail and in the greater proportional length of the distance between the eye and the nostril, and in having a complete set of ergots and chestnuts. It is inconceivable that the Norse variety could revert to the Prjevalsky horse type, or be regarded as an offshoot from the Celtic pony.

The question may now be asked, Is there any evidence that the Palæoliths of the south of Europe were familiar with horses of the Norse type? Fig. 7 gives an imperfect idea of a specimen of the Norse race from the west of Ross-shire. If this figure of a horse still living is compared with Fig. 2, which faithfully reproduces an engraving made thousands of years ago in the Combarelles cave by one of the artist-hunters of the Early Stone age, it will, I think, be admitted the Norse horse probably belongs to a very ancient race.